

Braehead Railway Bridge

It's not just rail companies that have to keep to a timetable. The clock is also ticking on roads engineers who have the challenge of dismantling and rebuilding a railway line.

The route of the new M8 motorway near Baillieston takes it directly through a busy rail route, used by thousands of commuters each day. The Rutherglen and Coatbridge railway line next to the Cutty Sark Bridge, which currently crosses the A8, will pass over the new M8.

The task facing Section Manager Dario Saavedra and his team is to dismantle the embankment upon which the rail line is built, prepare the ground below for the motorway and restore the rail line by installing a 150 metre long steel bridge.

This is a key structure of the entire project, said Dario and added: "We only have two very limited windows to do this work. The first stage happened over four weekends in April, when the rail line was completely closed.



This allowed the construction team to start laying foundations by installing eight piles, each two metres in diameter and several smaller piles that will retain the ground on the sides.

Meanwhile, the bridge is being fabricated section by section in a factory 200 miles away in Bolton, Lancashire. Once complete, these sections will arrive on site in Baillieston and be assembled into position on a platform 50 metres away from the railway line. Over the next few weeks, a welding team will carefully join the sections together and the deck will be cast.

Locals will see a huge burst of activity towards the middle of summer. The second stage will involve the railway line closing for the last two weeks of July to accommodate the most challenging part of the works, the bridge installation.

Dario explains "The second phase involves removal of the existing infrastructure of the railway line, cables, track and the embankment. The bridge, which will already have been assembled, will then be pushed into position on wheels. To move the concrete deck into position over the piers (legs), a slide method is necessary instead of a standard crane lift due to the weight of the 2,000 tonne structure.

"The system being used, a self-propelled modular transporter (SPMT), allows a smooth and safe transition of the 2,000 tonne structure into place. Then we will restore the track and the rest of the infrastructure on top of the bridge. All this must happen within these two weeks in July."

We will provide a further update in the next edition of the project newsletter.

Safety Cameras and reduced speed limit

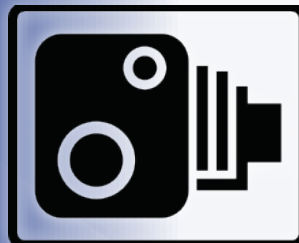
Backed by Police Scotland to ensure drivers slow down for the benefit of everyone's safety during what will be a busy period of construction this summer saw the introduction of a general speed limit of 50mph on the project roads followed by safety camera installation.

The cameras have been installed on the M74 northbound and southbound from Junction 6 Hamilton to Junction 3 Carmyle first and rolled out on the M73, A8 and M8.

A spokesperson for Police Scotland said: "Previous experience of major improvement works on this scale has shown that safety cameras have been extremely successful in encouraging motorists to stay within the speed limits."

Once the project is complete, road users travelling between Glasgow and Edinburgh will benefit by shaving almost 20 minutes off the daily commute and a 15 minute saving at Raith, which equates to an annual saving of a week spent behind the wheel commuting.

Further updates regarding the safety cameras will be published on the Transport Scotland website.



Environmental Surveys

Extensive monitoring of local wildlife uncovered some unusual activity at the side of the M74 motorway. The Environmental Team has been using wildlife cameras to monitor badger setts and otter holts.

In one location a possible badger sett was identified on the M74. The project's environmental advisor David Jones said that, at first, it was thought staff had uncovered a Badger's sett - all badger setts are protected under the Protection of Badgers Act of 1992. However further examination proved that it was being used by foxes. David said: "We found that the fox was pregnant - and now has two little cubs. We will not go near the fox hole until the cubs become independent and will continue to monitor the holes."

In another location on the M74 we are relocating an active badger sett under license from Scottish Natural Heritage, however we would not leave them without a home and to compensate, an artificial badger sett has been built close by the original.

Environmental Survey night vision camera captured a video of a fox cub emerging from the den for the first time



Did you know?

- Some Badger setts will have to be relocated to allow work to continue. Badgers are a protected species and relocation will only be done with the approval of Scottish Natural Heritage.
- Some vegetation cleared from various sites is harvested and used for Biomass, to provide clean energy.
- Some material gets 'chipped' and reintroduced to the top soil as organic matter.

Considerate Constructors

People living near any of project works areas have the comfort of knowing all of our sites are covered by the Considerate Constructors scheme.

This means that all work undertaken conforms to a national standard, where companies recognise the impact major works can have on the local community and tailor their work practices accordingly.



Contact the SRP team:

Scottish Roads Partnership
Hermiston House, Unit B,
M8 Central Business park
Greenhouse Road, Newhouse
Motherwell, ML1 5FL



Tel: 0800 042 0188
Email: info@scotroadspartnership.co.uk

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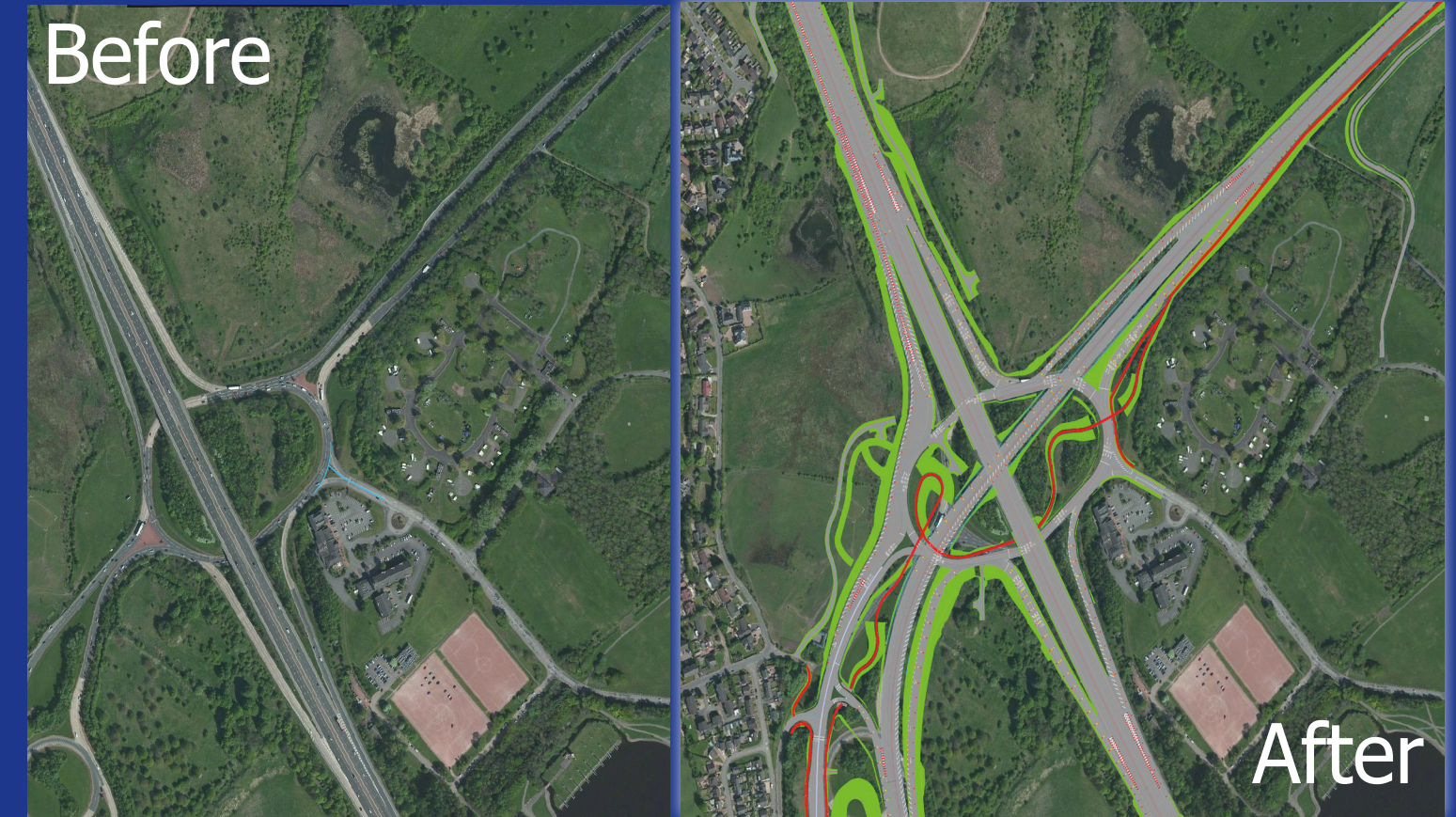
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Project update

Issue 4



Raith Junction Exclusive



Welcome to the fourth edition of the M8 M73 M74 Motorway Improvements Project newsletter. This issue provides an overview of the improvement works at Raith Junction following a public 'Drop - In' event held in May.

Braehead Railway Bridge

Works commenced to create a new railway bridge for the Rutherglen and Coatbridge railway line over the new M8



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BIM

Building Information Modeling (BIM) used for the first time on road project shows Raith in 3D



Page 4

Scottish Roads Partnership



ferrovial
agroman Lagan



Scottish Roads Partnership

Raith Junction is one of the busiest strategic connecting junctions within central Scotland's motorway network linking the M74 motorway with the A725 Bellshill Bypass and East Kilbride Expressway. The improvements at Raith will provide substantial benefits across Scotland's Central Belt. The M74 is the main route for road users between Glasgow and South West Scotland and provides an essential link to the M8 at Baillieston, via a one mile stretch of the M73.

Due to Raith being a unique engineering challenge and its importance to local and national traffic we decided to dedicate issue four to this junction and tell you more about what is involved in the works and traffic management, read the full story on page 3. Raith is also the first roads project in Scotland to benefit from Building Information Modelling (BIM), find out more on page 4.

Young people gain experience and learn new skills

Young people have been given an excellent opportunity to develop a career in construction as an apprentice on the M8 M73 M74 Motorway Improvements Project.

Supporting and developing youngsters in the local community is a key part of the project. Creating apprenticeships right through the supply chain ensures further opportunities to help young people learn and grow.

Some 20 apprenticeships were allocated at the start of the project, covering a variety of construction roles and as the job progresses, it is hoped to extend that opportunity to more young people.

As well as this, project management is offering site-based placements to graduates undertaking professional engineering training.

Fraser Scott, who is currently completing his SVQ level 3 in Civil Engineering, joined in an apprentice quality role and already finds the experience has brought new knowledge and skills. He said:

"Working for Ferrovial Lagan Joint Venture on the M8 M73 M74 Motorway Improvements Project will allow me to gain the necessary site experience in conjunction with my studies."

Fraser added: "The project team is excellent and is keen to offer assistance and share knowledge."

Many of the apprenticeship opportunities are created by project subcontractors, for example Glasgow based supplier Cusack, a local company providing traffic management signs for the scheme, has taken on three apprentices. One of them, James McLaren, has already completed his SVQ at Level 2 in warehousing and distribution.



Fraser Scott, Apprentice Quality Inspector (right) with Raul Pascual, FLJV Project Manager (left)

World War I trench helps to raise £55,000 for Erskine Hospital

"Can you build us a replica of a World War I trench in just four days?" Ferrovial Lagan JV were delighted to help Erskine Hospital with their request to construct the fortification; which was the charity's showpiece exhibit at the Ideal Homes Show Scotland event at the SECC in May.

Ferrovial Lagan JV agreed to supply £600 worth of timber and William Gilfillan, projects storeman and his colleague Graham Smith agreed to donate their time to the project. The result? A recreation of the conditions faced by British soldiers during the campaign of 1914-18. It helped raise £55,000 for Erskine Hospital as awe-struck visitors either donated cash or pledged monthly payments by direct debit.



The Raith Challenge



The construction team faces a unique engineering challenge in creating a new Raith Junction in Lanarkshire. Not only are they building a new elevated roundabout above the old one, they are also forging an underpass beneath it.

The team of experts who have worked on projects as far away as Texas and Chile, maintain that Raith is extremely complex and challenging by any standards.

However, confidence is high that by careful attention to detail and meticulous preparation, a modern structure will emerge that will reduce journey times, aid the environment and benefit the economy of Scotland.

The congestion problems at Raith are well-known. Almost 75,000 vehicles use the Raith Interchange in an average 12-hour period during the week. When you add traffic using the M74 motorway, it means that 143,000 vehicles a day would be affected by work taking place at Raith.

A spokesman from Scottish Roads Partnership (SRP) said: "Congestion is severe at morning and evening rush hours."

Raith Temporary Traffic Management

Sophisticated computer software has helped turn the mysteries of traffic management into something of an exact science. Major works at Raith Junction could ideally be undertaken if all traffic was banned from the area, allowing construction teams to forge on with the job in hand, but this junction is so vital to the Scottish economy that a curfew on cars is simply not an option.

The M74 motorway is Scotland's crucial link to England. The A725 that crosses it at Raith brings traffic to and from Ayrshire and the south west via the A725 and traffic from the east via the M8. Therefore the traffic management specialists, use 21st Century technology to predict what would happen if they introduced specific road restrictions.

Scott Rodgers, Traffic Management Co-ordinator at Raith, said: "The challenge we face is building a new roundabout on top of the existing alignment while the existing road remains in operation. Before we do anything to the traffic, we carry out extensive testing, work through each possible permutation of traffic routing and carry out detailed traffic modelling. This evaluates traffic volumes, possible traffic congestion, and the overall effect that our proposed solution will have on the existing traffic volumes using the current route. This is one of the busiest junctions in Scotland so we have to be sure that we minimise disruption in every stage of our construction works."

Scott added: "Our traffic models show us exactly what would happen to the traffic flows if we proposed to close half of the roundabout. It would also show where any congestion would occur and more importantly if the existing roads can cope with our proposed modifications. Therefore we can, through months of careful planning and preparation, arrange traffic management at certain times of the day to make areas of the junction available to enable us to carry out construction works."

Commuters travelling between the A725 to the M8 have little option but to use the existing roundabout."

Furthermore its location on a flood plain will present its own challenges when the excavation for the underpass which will take the north-to-south A725 traffic underground begins.

SRP spokesman added: "It will be challenging to create the underpass because the water table is so high at this point. But thanks to various water management measures such as Sustainable Urban Drainage System ponds, to which water is directed before being allowed to drain away naturally, what may seem like a big challenge will be an operational junction by Spring 2017."

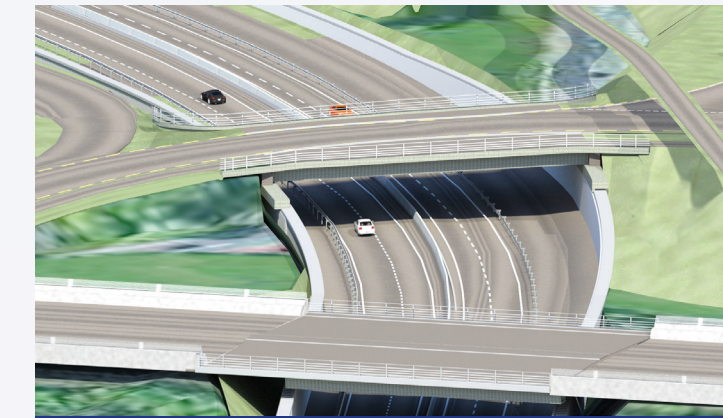
The final result will be a reduction in congestion at Raith, allowing people to get to work more quickly and for deliveries to get to their customers faster, thereby improving the overall economic prospects of the country.

Pedestrians and cyclists too, will benefit from the extensive improvements to footpaths and the creation of two new bridges which will separate pedestrians and cyclists from vehicles.

The spokesman continued: "We are creating a free flow of traffic on the A725 at Raith. We are also creating a safe passage for pedestrians and cyclists with a designated footpath and cycle route linking Bothwell to Strathclyde Country Park and the core path network. At the moment people find it very difficult to cross the roundabout. Some of the crossings are not even covered by signals. When our works are finished, pedestrians and cyclists will be able to enjoy safe, free passage from Bothwell to the park."

Building Information Modelling

The multi-million pound improvements to Raith already exist, however only in a virtual sense.



A725 S/B showing three of the new structures. The new M74 bridge, the southern bridge that will allow the roundabout traffic to cross over the new A725 and one of the two foot/cycle overpasses



View of the new underpass from the A725 looking at one of the new structures

The M8 M73 M74 Motorway Improvements Project is the first roads project in Scotland to benefit from Building Information Modelling (BIM).

Every single part of the new junction is drawn on computer by SRP's main contractor, Ferrovial Lagan JV and designers Amey and sub consultant RPS.



Aerial view of the new underpass & upgrade junction M74

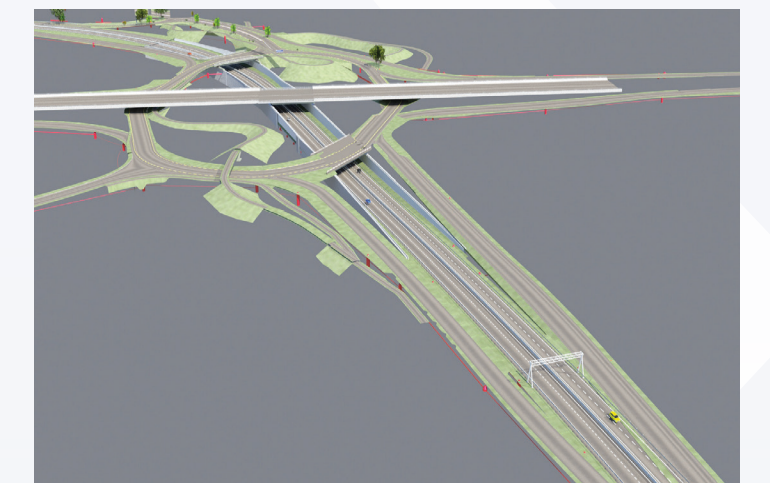
The result is a fly-through 3D model which allows problems to be detected, and overcome, before they ever happen in reality.

For example, the multi-dimensional model will contain vital information like the location of underground pipes. In turn, the sub contractor who is preparing to lay the foundations for a new bridge will be able to study the model and see that a gas pipe is too close to the place where he intended to drill.

By using this information, time and money is saved by asking the designers to move the foundation slightly. If that's not possible, the gas company could be asked to make a slight diversion in the pipe to allow work to begin.

A spokeswoman for the BIM team said: "The system allows us to foresee problems even before work has started on site. We can simply change things in the office at the click of a mouse. This fairly new technology saves time and money but it also makes things safer on site. It has already been used to design buildings, but this is the first time it has been applied to a motorway."

"People have experienced 3D movies, where it appears you are actually inside the movie. With BIM, we can stand and look 360 degrees around a junction which doesn't yet exist. It's a very exciting piece of technology."



Overall view of the underpass from the A725 north of Raith

The BIM spokeswoman added: "The contract includes 30 year maintenance following the construction of the new roads. This model will be made available to the engineers of the future. If there is any problems with the drainage system in 25 years time, they will be able to ask the system which kind of pipe is underground at that point. All of the information, like the type of materials used and even the diameter of the pipe will be in the system."

"If the lights at the side of the motorway need to be changed in 2020, all of the information right down to the make and intensity of the bulbs will be on the system. They will even be able to consult the manufacturer's manual!"